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# Rebuilding Iraq With Alternative Energy Solutions

By Captain Robert T. Moore

Iraq is blessed with one of the world's largest reserves of crude oil; sadly, the country has little or no refining capability. The lack of petroleum products makes it difficult to run generators and other equipment that produce reliable electricity. Consequently, every day, major cities and towns in Iraq suffer through prolonged power outages. This presents critical problems for high-security facilities, like border-crossing points, that need uninterrupted power but are so remote that they cannot be connected to the national power grid.

Fortunately, the engineering arm (J-7) of the Multi-national Security Transition Command-Iraq (MNSTC-I), in partnership with the United States Army Corps of Engineers, is funding and building alternative energy systems for these more remote locations.

In particular, the MNSTC-I J-7 team has designed a unique, rugged system leveraging both solar panels and a large wind turbine—affectionately referred to as “energy in a box”—at one border-crossing location. There, the combination system will be connected to the appropriate switch gear, allowing either

power source, or both, to generate electricity, depending on the environmental conditions.

The wind turbine will be capable of generating 500 kilowatt hours of electricity at a wind speed of only 12 miles an hour. Additionally, 24 solar panels are being installed that can provide more than 5,000 watts of peak power. Fortunately, Iraq has plenty of sunshine during the summer



Remote outpost building on the Iraq border





**MNSTC-I inspection of solar panels and wind turbine**

season when temperatures reach 135 degrees Fahrenheit. During the evening, there is also a surprising amount of wind blowing across the border between Iraq and Iran that can drive wind turbines.

The Iraqi border enforcement teams will run the systems. The coalition forces (through our contractors) will provide in-depth training to the Iraqis on how to operate and maintain the facilities. Costs vary greatly, depending on the amount of electricity needed to power the facility and whether solar panels, wind turbines, or a combination is used. Much of the equipment is covered by multiyear warranties, and the material, which is very reliable, should last for a long time if properly maintained. In addition, the costs are actually less over the long term compared with the expense of transporting fuel to large generators every week.

Presently, there are two sites where solar panels are being used. The first site has a solar-panel array that powers a water-well pump. The second site employs not only a full array of solar panels but also a large wind turbine. The alternative energy strategy is actually a test case that will be used to accumulate data so the Iraqis can evaluate the feasibility of establishing similar sites across the country. Coalition forces from MNSTC-I will record the wind and solar data and determine the success of both systems. The engineers can then determine the right mix of solar and wind solutions for other locations in Iraq.

In November 2009, this test facility became the first fully operational endeavor of its kind in Iraq. The J-7 team is evaluating various locations in Iraq, and through these efforts, the trainers and advisors from MNSTC-I are helping Iraqis build capacity and increase capability for their power infrastructure.

With the movement out of cities, towns, and villages by U.S. and coalition combat forces, Soldiers have adapted to a critical, noncombat support, such as training Iraqis to operate and maintain basic services. Even as MNSTC-I turns Iraq's infrastructure over to local government agencies, the J-7 will still be able to assist with new alternative energy solutions throughout the country.

Iraq's infrastructure is being rebuilt and restored. New roads, bridges, highways, electrical lines, and buildings are being erected. These provide the Iraqi people with the essential infrastructure they require to not only survive but also to prosper. Throughout Iraq, facilities have been restored to more normal conditions. Where there was no electricity available, new power lines from a national grid are being installed. Where there was no basic sewer and sanitation available, new septic systems are being built and wastewater treatment plants are being repaired and upgraded.

Even in a country located above expanses of oil, alternative energy programs featuring combined solar panels and wind turbines could be the answer to producing reliable electricity. Through these and other efforts, the trainers and advisors from MNSTC-I are building capacity and increasing capability of the Iraqi infrastructure. As Iraqis begin to shoulder more of the responsibility for operating and maintaining their facilities, their dependence on the coalition for assistance will diminish.



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